

REMARKS

Our inventors have provided improved memory management in a crowded technical field as follows:

[0012] So as to solve this problem, it is desirable to have a construction in which the control information includes type information that indicates a memory management start, the time stamp of the control packet is a presentation time stamp, and the control packet further includes a decode time stamp whose value indicates a point of a reproduction timeline of the digital stream, which corresponds to the memory management start, and a time at which the control information is read to a memory.

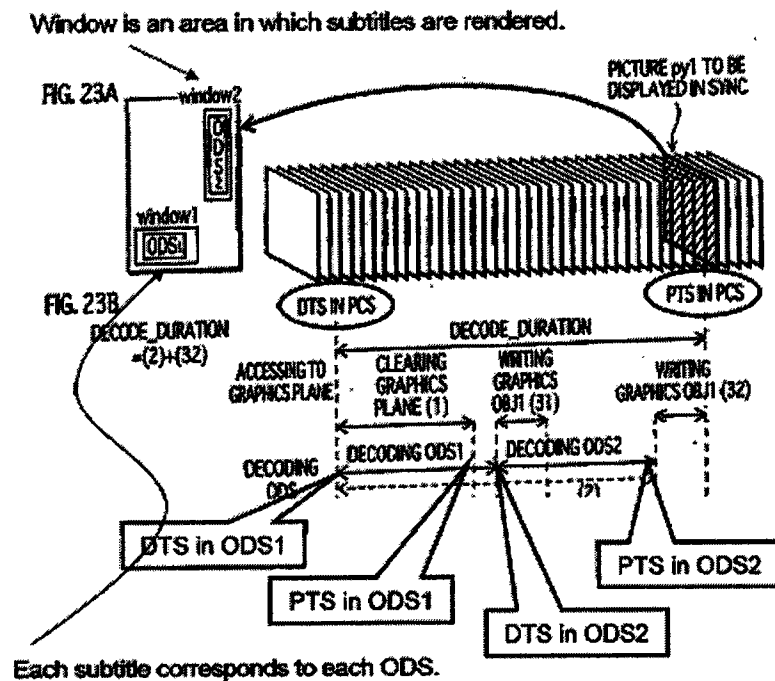
[0013] According to this construction, a memory management start is indicated by a decode time stamp of a packet storing control information. Therefore, by referring to the decode time stamp, it becomes possible to know on which point of the reproduction timeline each buffer for the decoder model should be flashed. If the flash point is considered as a starting point of memory management, it is easy to grasp the chronological occupancy transition of the buffer that stores control information, the buffer that stores graphics before being decoded, and the buffer that stores graphics after being decoded. By changing the value of this decode time stamp, it is possible to adjust the chronological transition of the state of the buffers. According to such adjustment, it becomes possible to avoid buffer overflow at the reproduction apparatus. Therefore, it becomes easy to implement hardware/software at the development stage of reproduction apparatus.

According to the present invention, the first presentation time stamp of the data packet indicates an end time of a process for decoding the graphics data, and the second presentation time stamp of the control packet indicates a presentation time of the graphics data. Hence, the present invention allows defining, on a reproduction time axis of the digital stream, a state where the graphics data has already been decoded but is not yet reproduced. This state occurs in a time period between the time indicated by the first presentation time stamp of the data packet and the time indicated by the second presentation time stamp of the control packet. By defining such a time period in which the graphics data has already been decoded but is not yet reproduced on the

reproduction time axis of the digital stream, we achieve the advantages of Paragraph [0013] above.

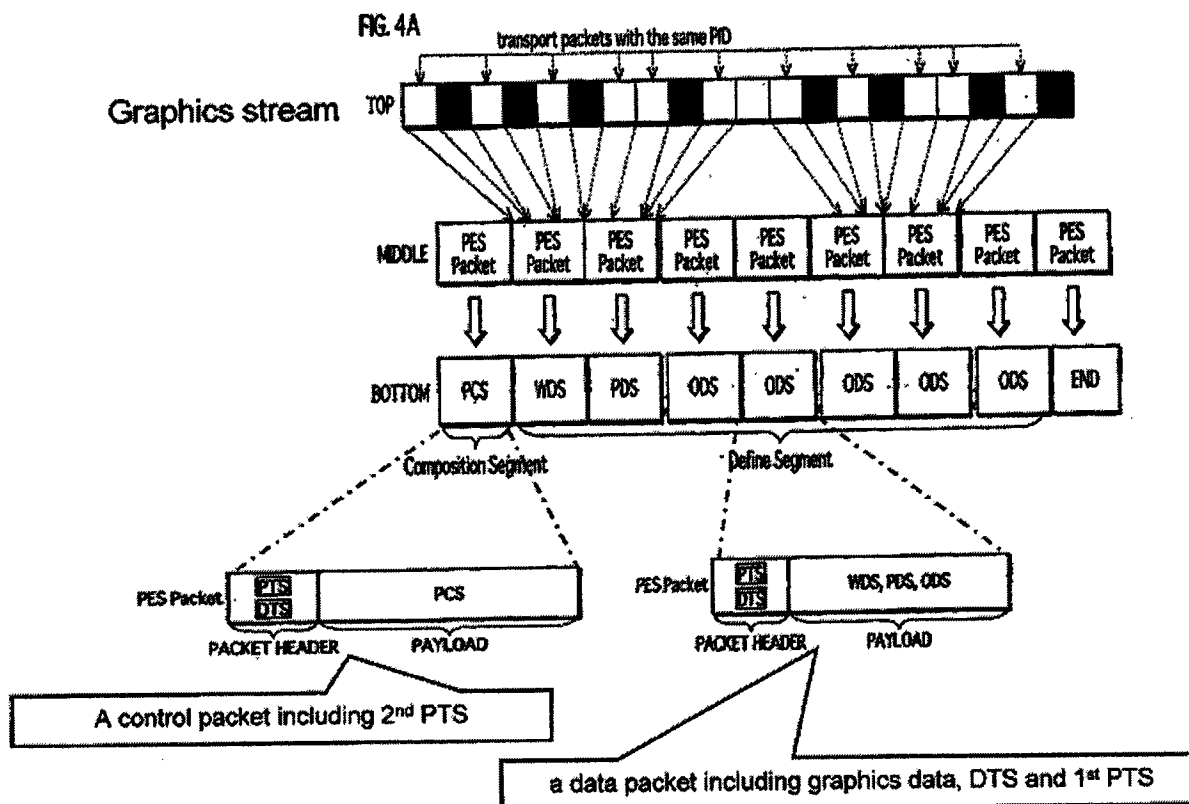
In other words, by defining the “state of already decoded but not yet displayed” on the reproduction time axis of the digital stream to be reproduced, it becomes possible to avoid concentration of an enormous amount of decoding load to one point.

<A feature of present invention>



Plural subtitles may be rendered in single window.
DTS and PTS of a window and those of corresponding subtitle should be separated.

<Present invention : a data packet and a control packet>



<Present invention : 1st PTS ,DTS and 2nd PTS>

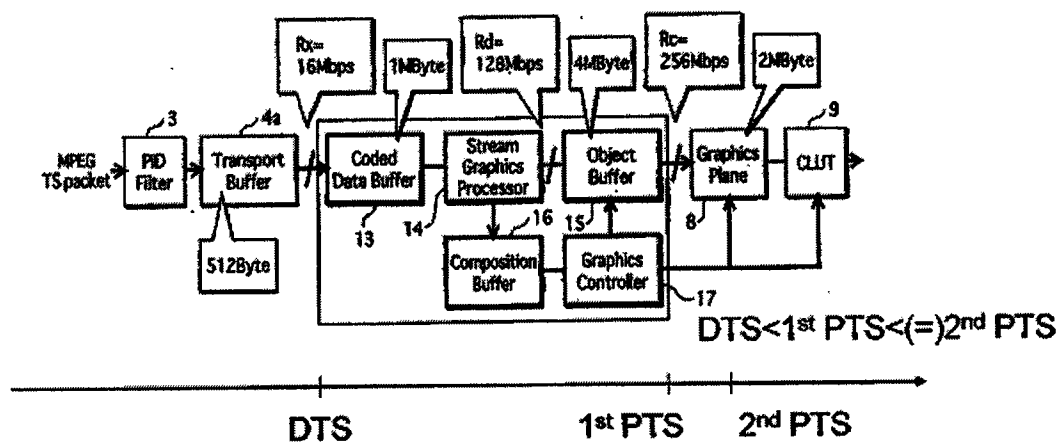
Definition

1st PTS : indicating an end time of the process of decoding

DTS : indicating a start time of a process of decoding

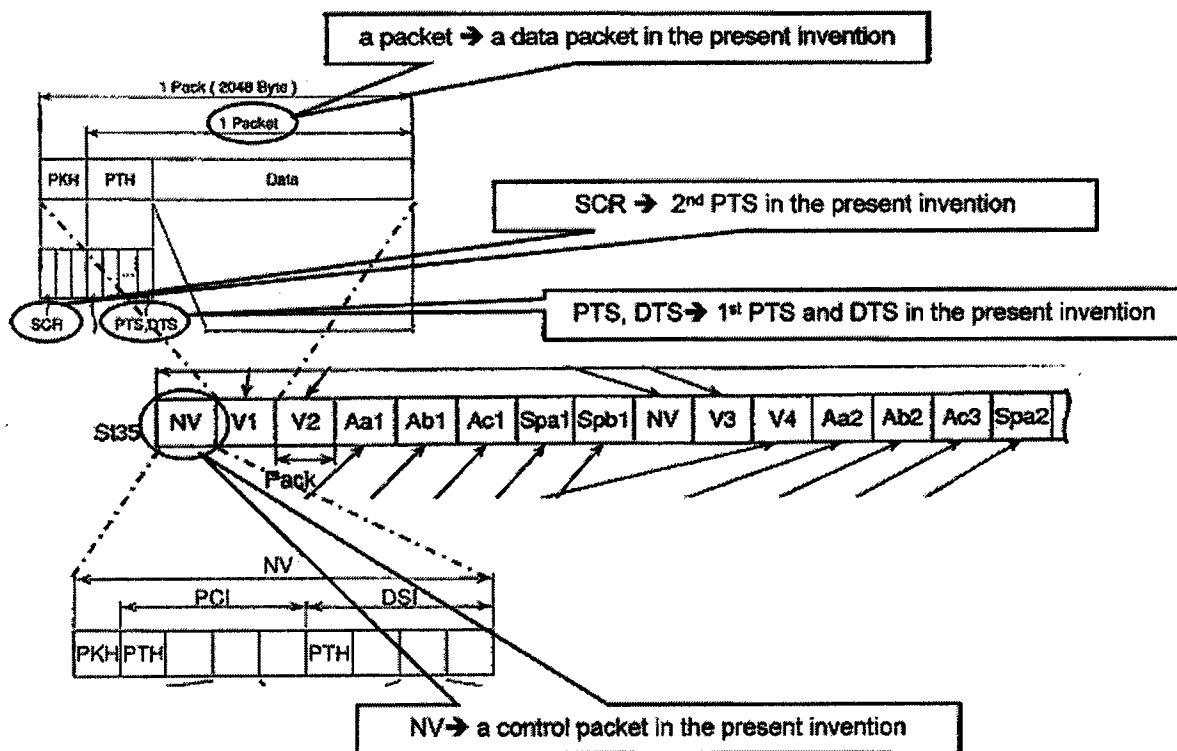
2nd PTS : indicating a presentation time which is at or after the end time

FIG. 27



Yamane et al. is owned by Applicant and is directed to authoring, under MPEG2, for (1) interleaving into contiguous plural video objects, interleaved units larger than the shortest road time so that video object presentation start and end points are aligned and (2) separate contiguous data blocks where video object presentation start and end points are not aligned.

Office Action : a data packet and a control packet in Yamane>



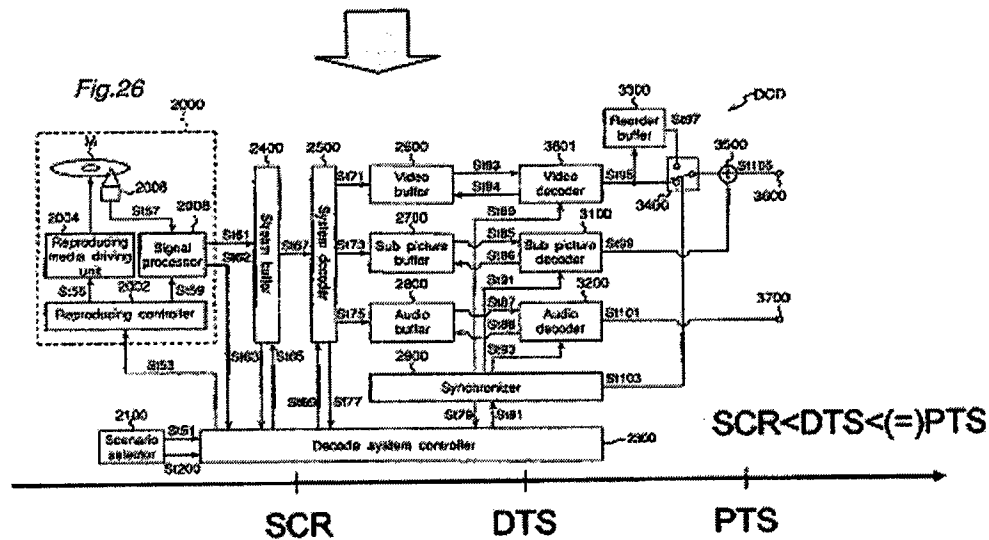
<PTS(1st PTS), DTS(DTS) and SCR(2nd PTS) in Yamane>

Definition

PTS : time at which the video data or audio data contained in the packet should be output as the playback output after being decoded

DTS : time at which the video stream should be decoded

SCR : time at which that pack is to be sent from stream buffer 2400 to system decoder 2500



Applicant requests a convenient telephone time and requests a phone call from the Examiner as to scheduling.

Very truly yours,

SNELL & WILMER L.L.P.

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